Final Determination

Seminole Electric Cooperative Incorporated
Hardee & Polk Counties, Florida

440 MW COMBINED CYCLE POWER PLANT

Department File No.: PSD-FL-214
(PA-89-25SA)

Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation

September 21, 1995

Final Determination

The Technical Evaluation and Preliminary Determination for the permits to construct a 440 megawatt (MW) combined cycle power plant consisting of two gas turbine generators, associated heat recovery steam generators, and a single steam turbine-generator at an electrical power plant site near Bowling Green, Hardee County, Florida, was distributed on February 21, 1995. The Notice of Intent to Issue was published in the Herald-Advocate on March 2, 1995. Copies of the evaluation were available for public inspection at the Department offices in Tampa and Tallahassee.

Comments on the evaluation and proposed permits were submitted by the applicant. No comments were submitted by the National Park Service and the U.S. Environmental Protection Agency.

Applicant's Comment:

The applicant requested a higher heat input rate for the combustion turbines and a corresponding increase in the mass emission rates for several of the pollutant, while maintaining the proposed emission concentrations in ppm for NO_x, etc. The applicant also requested an allowance for fuel bound nitrogen of up to 12 ppm for NO_x emissions when firing fuel oil. There were several other editorial changes that were also requested by the applicant.

Department of Environmental Protection (DEP) Response:

DEP concurs with the applicant in granting a higher heat input rate for the combustion turbines together with a corresponding increase in pollutant emissions. This is based on the need for a higher heat input rate in order to maintain the 440 MW electrical power production rate under the most adverse meteorological conditions (high temperature and humidity). The Department agrees that the applicant should get an allowance for fuel bound nitrogen but not to the extent that the applicant requested. The emission limit will remain 42 ppm NOx. The Department is willing to provide an allowance of up to 6 ppm for NO_x emissions while firing fuel oil. The applicant must be able to substantiate, by fuel testing and continuous monitoring the reasons for excess emissions explainable by fuel-bound nitrogen. The Department agrees with the applicant on editorial changes.

The final action of the Department will be to issue the PSD permit (PSD-FL-214) with the changes noted above.

State of Florida
Department of Environmental Protection
Notice of Permit

In the matter of an
Application for Permit by:

DEP File No. PSD-FL-214
Polk and Hardee Counties

Mr. William C. Walbridge
Executive Vice President
Seminole Electric Cooperative Inc.
Post Office Box 272000
Tampa, Florida 33688-2000

Enclosed is Permit PSD-FL-214 to construct a power plant facility at County Road 663, Hardee County, Fort Green, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 14 days from the date this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

C. H. Fancy, P.E., Chief
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
904-488-1344

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this **NOTICE OF PERMIT** and all copies were mailed by certified mail before the close of business on 9-28-95 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to §120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk 9-28-95
Date

Copies furnished to:

W. Thomas, SWD
R. Harwood, PC
J. Harper, EPA
J. Bunyak, NPS
D. Roberts, HGSS
K. Kosky, KBN

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

PERMITTEE:
Seminole Electric Cooperative Incorporated
P.O. Box 272000
Tampa, FL 33688-2000

Permit Number: PSD-FL-214 (PA-89-25SA)
Expiration Date: January 1, 2000
County: Polk & Hardee
Latitude/Longitude: 27°38'30"N 81°57'45"W
Project: 440 MW Combined Cycle Power Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-212 and 62-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and specifically described as follows:

For a 440 MW combined cycle power plant consisting of two 150 MW combustion turbines (CTs), two heat recovery steam generators (HRSGs), a 140 MW steam turbine generator and a 4.4 million gallon fuel oil storage tank. The maximum heat input at 32°F is 1,862 MMBtu/hr/CT (natural gas) and 1,965 MMBtu/hr/CT (oil). The plant will be located at the Polk and Hardee County site near Bowling Green, Florida which is also the site of a 295 MW power plant which is operated by TECO Power Services. The combustion turbines are to be Westinghouse Model 501F or equivalent and equipped with dry low NO_x combustors or an equivalent system for natural gas firing and wet injection for fuel oil firing. The CT will be fired with natural gas and No. 2 low sulfur fuel oil with a sulfur content limit not to exceed 0.05 percent, by weight, as a back-up only.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Seminole Electric Cooperative Incorporated's (SECI) application received May 9, 1994.
2. Department's letters dated June 27, September 21, and November 16, 1994.
3. SECI's letters dated August 26, October 6, and November 23, 1994.
4. SECI's letter dated February 9, 1995.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of F.S. and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

GENERAL CONDITIONS:

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and,

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. A description of and cause of non-compliance; and,

b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the F.S. or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and F.S. after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by F.S. or Department rules.

GENERAL CONDITIONS:

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(X) Determination of Best Available Control Technology (BACT)
(X) Determination of Prevention of Significant Deterioration (PSD)
(X) Compliance with New Source Performance Standards (NSPS)

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and,
- the results of such analyses.

GENERAL CONDITIONS:

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

The construction and operation of the project shall be in accordance with all applicable provisions of Chapters 62-210 through 62-297 and 62-4, Florida Administrative Code (F.A.C.), and 40 CFR 60, Subpart GG, Appendix A, Appendix B, and Appendix F (1994 version). The following emission limitations and conditions reflect the BACT determinations for the 300 megawatts (MW; two 150 MW combined cycle combustion turbines) of generating capacity. Each combustion turbine (CT) will be connected to a heat recovery steam generator (HRSG), which will recover the waste heat to produce steam for utilization in a single 140 MW (net) steam generator. There is no fuel firing in the associated HRSG. The facility will have a total nominal generating capacity of 440 MW (net). In addition to the foregoing, the project shall comply with the following Specific Conditions:

A. General Requirements

1. Pursuant to Rule 62-212.200(56), F.A.C., Potential to Emit (PTE), the maximum heat input to each Westinghouse 501F CT, or equivalent, at an ambient temperature of 32°F, shall neither exceed 1,862 MMBtu/hr while firing natural gas nor 1,965 MMBtu/hr while firing fuel oil.

2. Pursuant to Rule 62-212.200(56), F.A.C., PTE, the CTs may operate continuously, i.e., 8,760 hrs/year.

3. Pursuant to Rule 62-212.200(56), F.A.C., PTE, only natural gas or No. 2 fuel oil is allowed to be fired in the CTs. The maximum sulfur content limit of the No. 2 fuel oil shall not exceed 0.05 percent, by weight.

4. Pursuant to Rule 62-212.200(56), F.A.C., PTE, the maximum No. 2 fuel oil consumption allowed to be burned is 41,751,000 gallons per year, which is equivalent to 1500 hours per CT per year of operation at full load(not to exceed 3,000 hrs/yr between the two CTs). The No. 2 fuel oil is to be used as a back-up fuel only.

5. Pursuant to Rule 62-296.310(3),F.A.C., Unconfined Emissions of Particulate Matter (PM), the emissions of unconfined PM shall be minimized during the construction period by covering or watering dust generating areas.

SPECIFIC CONDITIONS:

B. Emission Limits

1. Pursuant to Rule 62-212.410, F.A.C., BACT, the maximum allowable emission limitations from two CTs, when firing natural gas or No. 2 fuel oil, shall not exceed the following:

MAXIMUM ALLOWABLE EMISSION LIMITATIONS

POLLUTANT	FUEL	CONCENTRATION	lbs/hr(a)	TPY(b)	TPY(TOTAL)[c]
NO_x	Gas	15 ppmvd(d)	106	931	1212
	Oil	42 ppmvd(e)	336	504	
CO	Gas	20 ppmvd	71	622	618
	Oil	25 ppmvd	91	136	
PM/PM_{10}	Gas		7	65	147
	Oil		67	100	
SO_2	Gas		5	47	182
	Oil		101	152	
VOC	Gas	5 ppmvd	10	88	99
	Oil	10 ppmvd	21	31	
Sulfuric Acid Mist	Gas		1	6	39
	Oil		22	34	
Beryllium	Oil		0.0049	0.007	0.007
Arsenic	Oil		0.0097	0.014	0.014
Visible Emissions	Gas		≤ 10 percent opacity		
	Oil		≤ 10 percent opacity		

(a) The emission limitations in lbs/hr/CT are a 1-hour average as determined pursuant to the Performance Testing conducted pursuant to Condition C.1 below.

(b) The annual emission limitations (TPY) for natural gas are based on two CTs operating at full load for 8,760 hours per year. The annual emission limitations (TPY) for fuel oil are based on the equivalent of full-load operation for a maximum of 1500 hours per year for each of the two CTs (not to exceed 3,000 hrs/yr between the two CTs). The emission calculations are also based at a worst case ambient temperature of 32°F.

(c) Maximum allowable emissions from two CTs if any fuel oil is burned at the facility during the year. The emission calculations are also based at an ambient temperature of 59°F.

SPECIFIC CONDITIONS:

(d) The natural gas NO_X allowable emission limitation of 15 ppmvd is corrected to 15 percent O_2. Compliance shall be determined through the initial and annual compliance tests.

(e) The fuel oil NO_X allowable emission limitation of 42 ppmvd is corrected to 15 percent oxygen. Compliance shall be determined through the initial and annual compliance tests. The annual compliance test will be required if the fuel oil is fired for more than 400 hours in the preceding 12-months.

For fuel oil firing, NO_X emissions of 42 ppmvd @ 15 percent O_2 are based on fuel bound nitrogen (FBN) content of 0.015 percent by weight or less. When FBN levels are above this percentage, the CTs may produce higher NO_X concentrations due to increased fuel NO_X formation. When FBN levels are above 0.015 percent, the operator shall employ all reasonable measures to maintain the NO_X concentrations below 42 ppmvd. However, NO_X emissions (ppmvd and lb/hr), as calculated from the formula below, shall be allowed if the permittee submits data (FBN levels from most recent fuel shipment or as fired fuel sampling and hourly averages of: fuel rate, heat rate, ambient conditions, and NO_X control system parameters) which demonstrates that emissions (hourly averages) above 42 ppmvd are due solely to FBN levels above 0.015 percent.

The emission level for NO_X is adjusted for higher fuel nitrogen contents up to a maximum of 0.030 percent by weight as follows:

FUEL BOUND NITROGEN %(by weight)	NO_X LEVELS (ppmvd @ 15% O_2)	NO_X EMISSIONS (lb/hr/CT)[1]	NO_X EMISSIONS INCREASE (TPY)[1]
0.015 or less	42	336.2	0
0.020	44	352.1	0
0.020	46	368.2	0
0.030	48	384.2	0

1 - From 336.2 lb/hr/CT at 32^0F basis.

For intermediate values of FBN use the formula:

$$STD = 0.0042 + F$$

where,
STD = allowable NO_X emissions (ppmvd @ 15% O_2)
F = NO_X emission allowance for fuel bound nitrogen
and
N (fuel bound nitrogen), is defined as follows:

SPECIFIC CONDITIONS:

N (% by weight)	F (NO_x % by volume)
$0<N\leq 0.015$	0
$0.015<N\leq 0.030$	$0.04\ (N-0.015)$
$0.030<N$	0.0006

2. The following estimated CT emissions are tabulated for PSD tracking purposes only:

ESTIMATED EMISSIONS

POLLUTANT	FUEL	TPY
Lead	Oil(a,b)	0.16
Fluoride	Oil(a,b)	0.090
Mercury	Gas(c)	0.0003
	Oil(a,b)	0.024

(a) The annual emission limitations (TPY) for fuel oil are based on full-load operation for a total of 3,000 hours per year between the two CTs at an ambient temperature of 59°F.

(b) The No. 2 fuel oil shall have a maximum sulfur content limit of 0.05 percent, by weight.

(c) The annual emission limitation (TPY) for natural gas is based on two CTs operating at full-load for 8,760 hours per year at an ambient temperature of 59°F.

3. The permittee will install a dry low-NO_x combustor system or an equivalent system on each CT. The permittee shall make every practicable effort to achieve the lowest possible NO_x emission rate, but must not exceed 15 ppmvd at 15 percent O_2 per CT on a continuous basis when firing natural gas.

4. After the initial compliance tests on the CTs, the permittee shall operate a certified continuous emissions monitor for NO_x emissions and collect 12 months of monitoring data. The monitor will, at a minimum, meet the requirements of 40 CFR 60, Appendix F's quality assurance procedures. Within 18 months after the initial compliance test, the permittee shall prepare and submit

SPECIFIC CONDITIONS:

for the Department's review an engineering report regarding the collection and the analysis of the data gathered from the monitor. In addition, this report shall include a conclusion regarding the lowest NO_x emission rate that can be consistently achieved with a reasonable operating margin, taking into account long-term performance expectations and assuming good operating and maintenance practices. The report shall also include results of the testing requirements of 40 CFR 60, Appendix F's quality assurance procedures and the actual CEMS data for the period of the study in an acceptable format.

5. The Department will make a determination as to whether to seek to revise the permitted NO_x emission limitation and will base it on the engineering data report submitted by the permittee. If the data demonstrate that a NO_x emission rate of less than 15 ppmvd at 15 percent O_2 is consistently achievable, the NO_x emission limit may be adjusted accordingly, but not lower than 9 ppmvd at 15 percent O_2.

6. Excess emissions from a turbine resulting from start up, shutdown, malfunction, fuel switch or load change shall be reported in accordance with 40 CFR 60.334(c) and accepted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized, but in no case exceed two hours in any 24-hour period unless specifically authorized by the Department for a longer duration. The permittee shall provide a general description of the procedures to be followed during periods of start up, shutdown, malfunction, fuel switch or load change to ensure that the best operational practices to minimize emissions will be adhered to and the duration of any excess emissions will be minimized. The description should be submitted to the Department along with the initial compliance test data. The description may be updated as needed by submitting such update to the Department within thirty (30) days of implementation.

7. Excess emissions from fuel switching shall not exceed 15 minutes.

8. Excess emissions due to fuel bound nitrogen levels above 0.015 percent are allowed pursuant to Condition B.1 foot note (e) of the emission limitation table.

C. Performance Testing

1. Initial (I) compliance tests shall be performed on each CT using both fuels. Testing of emissions shall be conducted at

SPECIFIC CONDITIONS:

95-100% of the manufacturer's rated heat input based on the average ambient air temperature for the CT during the test. Annual (A) compliance tests shall be performed on the CT with the fuel(s) used for more than 400 hours in the preceding 12-month period. Tests at permit renewal shall also be performed on the non-PSD pollutants. Tests and procedures shall be in accordance with 40 CFR 60.335. Tests shall be conducted using EPA reference methods in accordance with 40 CFR 60, Appendix A, as adopted by reference in Chapter 62-297, F.A.C, and follows:

a. Reference Method 5B for PM (I, A: for oil only; assumption is that all PM is PM_{10}).

b. Reference Method 9 for VE (I, A).

c. Reference Method 10 for CO (I, A).

d. Reference Method 20 for NOx (I, A) or Method 7E if sampling downstream of the heat recovery steam generator.

e. Reference Method 18 or 25A for VOC (I, A).

f. Reference Method 8 for H_2SO_4 Mist (I, A).

g. Trace elements of Beryllium (Be) and Arsenic (As) shall be tested (I, for oil only) using EMTIC Interim Test Methods. As an alternative, EPA Method 104 for Be may be used; or, Be and As may be determined from fuel analysis using either Method 7090 or 7091 and sample extraction using Method 3040, as described in the EPA solid waste regulations SW 846.

h. ASTM D4294 (or equivalent) for sulfur content of distillate oil (I and A), which can be used for determining SO_2 emissions annually.

i. ASTM D1072-80, D3031-81, D4084-82, or D3246-81 (or equivalent) for sulfur content of natural gas (I; and, A if deemed necessary by the Department).

j. Other U.S. EPA or DEP approved test methods for the permitted facilities may be used for compliance testing after departmental approval. Unless the permittee requests to modify a reference method, or to use a method for which a method was not designed, such approval shall not constitute an alternative test procedure under Section 62-297.620, F.A.C., or otherwise require modification of the permit.

SPECIFIC CONDITIONS:

2. The maximum sulfur content of the fuel oil shall not exceed 0.05 percent, by weight. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334(b).

3. As an alternative to Condition C.1.i above, natural gas supplier data for sulfur content may be submitted. However, the applicant is responsible for ensuring that the procedures above are used for determination of fuel sulfur content. Analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e) (1993 version). Any request for a future custom monitoring schedule shall be made in writing to the Department's Bureau of Air Regulation. Any custom schedule approved by the USEPA pursuant to 40 CFR 60.334(b) (1993 version) will be recognized as enforceable provisions of the permit.

D. Monitoring Requirements

Monitoring of operations shall be in accordance with 40 CFR 60.334. Also, and for each CT, the permittee shall install, operate, and maintain a continuous emission monitoring system (CEMS) to monitor nitrogen oxides in accordance with 40 CFR 60, Appendix F, and, if necessary, a diluent gas (CO_2 or O_2). The Federal Acid Rain Program requirements of 40 CFR 75 shall apply when those requirements are adopted and if applicable.

1. Each CEMS shall meet performance specifications of 40 CFR 60, Appendix B.

2. CEMS data shall be recorded and reported in accordance with Rule 62-297.500, F.A.C.; 40 CFR 60; and, 40 CFR 75, if it becomes applicable. The record shall include periods of start up, shutdown, load change, fuel switch, high fuel bound nitrogen, and malfunction.

3. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

4. The procedures under 40 CFR 60.13 shall be followed for installation, evaluation, and operation of all CEMS. If applicable, 40 CFR 75 shall apply when the Federal Acid Rain Program is adopted.

SPECIFIC CONDITIONS:

5. For purposes of the reports required under this permit, excess emissions, as determined pursuant to Condition B.6 herein, are defined as any calculated average emission rate which exceeds the applicable emission limitation in Condition B.1.

E. Notification, Reporting and Recordkeeping

1. To determine compliance with the natural gas and fuel oil firing heat input limitation, the permittee shall maintain daily records of natural gas and fuel oil consumption for each turbine, and provide the heating value for each fuel during the compliance test. All records shall be maintained for a minimum of three years after the date of each record and shall be made available to representatives of the Department upon request.

2. The project shall comply with all the applicable requirements of Chapters 62-210 through 62-297 and 62-4, F.A.C., and 40 CFR 60, Subparts A and GG. The requirements shall include:

a. 40 CFR 60.7(a)(1) - By postmarking or delivering notification of the start of construction no more than 30 days after such date.

b. 40 CFR 60.7(a)(2) - By postmarking or delivering notification of the anticipated date of the initial start up of each CT not less than 30 days prior to such date.

c. 40 CFR 60.7(a)(3) - By postmarking or delivering notification of the actual start up of each turbine within 15 days after such date.

d. 40 CFR 60.7(a)(5) - By postmarking or delivering notification of the date for demonstrating the CEMS performance, no less than 30 days prior to such date.

e. 40 CFR 60.7(a)(6) - By postmarking or delivering notification of the anticipated date for conducting the opacity observations no less than 30 days prior to such date.

f. 40 CFR 60.7(b) - By initiating a recordkeeping system to record the occurrence and duration of any start up, shutdown, load change, fuel switch, high fuel bound nitrogen, and malfunction of a turbine, malfunction of the air pollution control equipment, and the periods when the CEMS is inoperable.

SPECIFIC CONDITIONS:

g. 40 CFR 60.7(c) - By postmarking or delivering a quarterly excess emissions and monitoring system performance report within 30 days after the end of each calendar quarter. This report shall contain the information specified in 40 CFR 60.7(c) and (d).

h. 40 CFR 60.8(a) - By conducting all performance tests within 60 days after achieving the maximum turbine and boiler firing rates, but not more than 180 days after the initial start up of each CT.

i. 40 CFR 60.8(d) - By postmarking or delivering notification of the date of each performance test required by this permit at least 30 days prior to the test date; and,

j. Rule 62-297.345 - By providing stack sampling facilities for each turbine.

k. All notifications and reports required by this specific condition shall be submitted to the Department's Southwest District office. Performance test results shall be submitted within 45 days of completion of such test.

3. The following information shall be submitted to the Department's Bureau of Air Regulation within 90 days after the permittee has made the selection of the following:

a. Description of the final selection of the turbines for installation at the facility. The descriptions shall include the specific make and model numbers and any changes in the proposed method of operation, fuels, emissions or equipment.

b. Description of the CEMS selected. The description shall include the type of sensors and the manufacturer and model numbers of the equipment.

4. The following protocols shall be submitted to the Department's Southwest District office for approval:

a. CEMS Protocol - Within 120 days after selection of the CEMS, but 180 days prior to the initial startup, a CEMS protocol describing the system, its installation, operating and maintenance characteristics and requirements. The protocol shall meet the requirements of 40 CFR 60.13, Appendix B and Appendix F or 40 CFR 75, and be approved within 60 days.

SPECIFIC CONDITIONS:

b. Performance Test Protocol - At least 90 days prior to conducting the initial performance tests required by this permit, the permittee shall submit to the Department's Southwest District office a protocol outlining the procedures to be followed, the test methods and any differences between the reference methods and the test methods proposed to be used to verify compliance with the conditions of this permit. The Department shall approve the testing protocol within 60 days provided that it meets the requirements of this permit.

c. Heat Input Curves - Within 120 days after final selection of the turbine, but 180 days prior to initial startup of the turbine, manufacturer's curves or equations of heat input corrections to other temperatures shall be provided to the Department. Subject to the approval by the Department for technical validity while applying sound engineering principles, the manufacturer's curves shall be used to establish the heat input rates over a range of temperatures for the purposes of compliance determination.

F. Modifications

The permittee shall give written notification to the Department when there is any modification to this facility pursuant to Rule 62-212.200, F.A.C., Definitions - Modifications. This notice shall be submitted sufficiently in advance of any critical date involved to allow sufficient time for review, discussion, and revision of plans, if necessary. Such notice shall include, but not be limited to, information describing the precise nature of the change; modifications to any emission control system; production capacity of the facility before and after the change; and, the anticipated completion date of the change.

G. No. 2 Fuel Oil Storage Tank

The permittee shall be in compliance with the monitoring requirements of 40 CFR 60.116b(a) and (b).

H. Additional General Conditions

1. Pursuant to Rule 62-4.090, F.A.C., the permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation prior to 60 days before the expiration of the permit.

SPECIFIC CONDITIONS:

2. An application for an operation permit pursuant to Rule 62-4.220, F.A.C., is not required if the facility is also certified under the Power Plant Siting Act, Chapter 403, Part II, F.S. That certification serves as the operation permit also. The permittee must submit an application for an operation permit for a major source of pollution pursuant to Chapter 62-213, F.A.C.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Howard L. Rhodes, Director
Division of Air Resources Management

Best Available Control Technology (BACT) Determination
Seminole Electric Cooperative Incorporated (SECI)
Hardee and Polk Counties
PSD-FL-214
PA89-25SA

The applicant proposes to install two combined cycle combustion turbine (CT) generators and associated steam cycle at a facility adjacent to the Hardee Power Station's existing units located in Hardee and Polk Counties. The facility, referred to as Hardee Unit 3, will consist of two 150 megawatt (MW) Westinghouse Model 501F, or equivalent, advanced CTs. Each CT will be connected to a heat recovery steam generator (HRSG), which will recover the waste heat to produce steam for utilization in a single 140 MW (net) steam turbine. The facility will have a total nominal generating capacity of 440 MW (net). The primary fuel for the CTs will be natural gas, with distillate fuel oil containing a maximum sulfur content of 0.05 percent, by weight, designated as the backup fuel. Natural gas will be transported to the facility via pipeline and fuel oil will be delivered by truck and stored on site in a 4.4 million gallon above ground storage tank.

In 1990, the Hardee Power Station was certified for 660 MW of generation in a phased construction schedule as follows:

1. TECO Power Services - 295 MW (1993) (Phase 1A).
2. TECO Power Services - 145 MW (future unit) (Phase 1B).
3. SECI - 220 MW (date unspecified) (Phase 2).

This new certification does not change Phases 1A and 1B, above, but will increase the SECI certified generation (Phase 2) from 220 MW to 440 MW, with an inservice date of January, 1999. A simplified flow diagram of Hardee Unit 3 is shown in Figure 1. Because of the phased construction activity, the Department looked at the total emissions from the Phase 2 project to see if any additional pollutants (i.e., Hg, Pb, etc.) should be reviewed from the BACT determination process.

The applicant has indicated the maximum annual air pollutant emission rates associated with the facility, based on 100 percent capacity factor and type of fuel fired, to be as follows:

Pollutant	Emissions (TPY) Fuel Oil	Natural Gas	Natural Gas-Steam for Power Augmentation	Total	PSD Significant Emission Rate (TPY)	Subject to PSD Review?
Potential Emissions[a]						
SO_2	145	36.7	NA	182	40	Yes
PM/PM_{10}	95.4	51.5	NA	147	25/15	Yes
NO_X	479.9	732.6	NA	1,212	40	Yes
CO	128	489.5	NA	618	100	Yes
VOC	29.2	69.9	NA	99	40	Yes
Lead	0.16	NA	NA	0.16	0.6	No
Arsenic	0.014	NA	NA	0.014	Any	Yes
Beryllium	0.007	NA	NA	0.007	0.0004	Yes
Fluoride	0.090	NA	NA	0.090	3	No
Mercury	0.025	0.00035	NA	0.025	0.1	No
Sulfuric Acid Mist	32.2	7.24	NA	39	7	Yes

Note: NA = not applicable.

[a] Emission rates are based on two CTs firing fuel oil for 1,500 hours each and natural gas for 7,260 hours at ambient temperature of 59°F (without power augmentation) and relative humidity of 60 percent.

Rule 62-212.400, Florida Administrative Code (F.A.C.), Stationary Source Preconstruction Review, requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

Date of Receipt of a BACT Application
May 9, 1994.

BACT Determination Requested by the Applicant

FIGURE 1

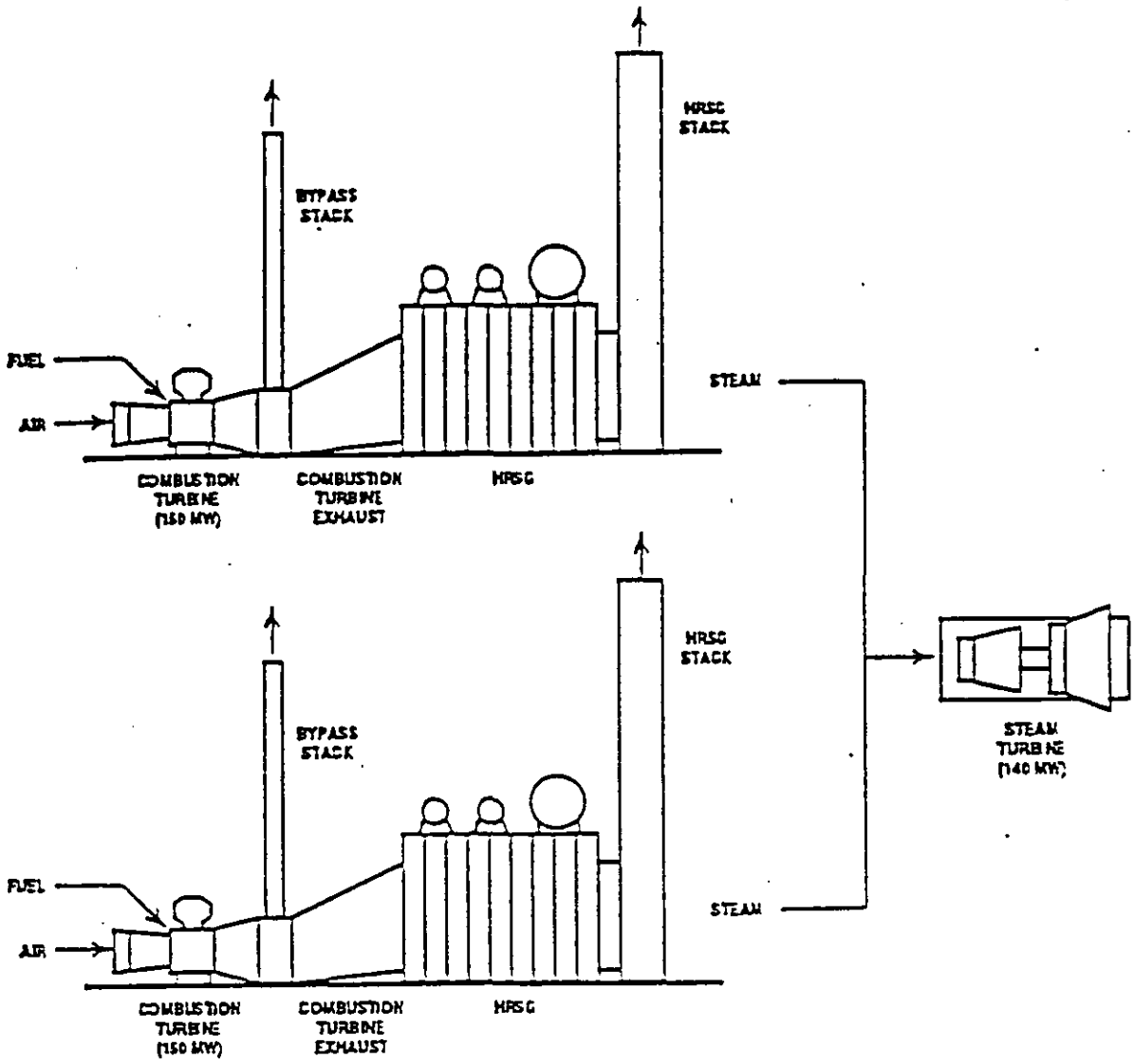

Figure 2-4
Schematic Flow Diagram of Hardee Unit 3 Facility

SEMINOLE ELECTRIC COOPERATIVE INCORPORATED

Combined Cycle Combustion Turbines

Pollutant	Fuel	
	Natural Gas	Fuel Oil
NO_x	15 ppmvd @ 15% O_2 at ISO 25 ppmvd @ 15% O_2 at ISO (power augmentation mode) Dry Low NO_x Burners	42 ppmvd @ 15 % O_2 & 0.0015% FBN at ISO Water Injection Limited Fuel Oil Operation
SO_2	Firing with Natural Gas	Low Sulfur Fuel Oil (0.05 %, by weight) Limited Fuel Oil Operation
CO	20 ppmvd 50 ppmvd (power augmentation mode) Combustion Control	25 ppmvd Combustion Control Limited Fuel Oil Operation
VOC	5 ppmvd Combustion Control	10 ppmvd Combustion Control
PM/PM_{10}	Combustion Control	Combustion Control Limited Fuel Oil Operation
Beryllium	Good Quality Fuel	Good Quality Fuel Limited Fuel Oil Operation
Inorganic Arsenic	Good Quality Fuel	Good Quality Fuel Limited Fuel Oil Operation
Benzene	Combustion Control	N/A

BACT Determination Procedure

In accordance with Rule 62-212.410, F.A.C., BACT Review, Stationary Source - Preconstruction Review, the BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of BACT pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine for the emission source in question the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

The air pollutant emissions from combined cycle power plants can be grouped into categories based upon what control equipment and techniques are available to control emissions from these facilities. Using this approach, the emissions can be classified as follows:

- Combustion Products (e.g., particulate matter and trace metals). Controlled generally by good combustion of clean fuels.

- Products of Incomplete Combustion (e.g., CO and VOCs). Control is largely achieved by proper combustion techniques.

- Acid Gases (e.g., SO_2, NO_x). Controlled generally by gaseous control devices and fuel quality.

Grouping the pollutants in this manner facilitates the BACT analysis because it enables the equipment available to control the type or group of pollutants emitted and the corresponding energy, economic, and environmental impacts to be examined on a common basis. Although all of the pollutants addressed in the BACT analysis may be subject to a specific emission limiting standard as a result of PSD review, the control of "nonregulated" air pollutants is considered in imposing a more stringent BACT limit on a "regulated" pollutant (i.e., particulate matter, sulfur dioxide, fluorides, sulfuric acid mist, etc.), if a reduction in "nonregulated" air pollutants can be directly attributed to the control device selected as BACT for the abatement of the "regulated" pollutants.

BACT POLLUTANT ANALYSIS

COMBUSTION PRODUCTS

Particulate Matter (PM/PM_{10})

The design of the CT system ensures that PM/PM_{10} will be minimized by combustion control and the use of clean fuels. The PM/PM_{10} emissions from the CTs, when burning natural gas and fuel oil, will not exceed 7 lbs/hr/CT (gas) and 67 lbs/hr/CT (oil) for the Westinghouse 501F, or equivalent, (with no power augmentation) at 100% load. The assumption is that all PM emissions are PM_{10} emissions.

Beryllium and Inorganic Arsenic (Be, As)

The Department agrees with the applicant's rationale that there are no feasible methods to control Be, As, and other trace pollutants, except by requiring good quality fuel. Limiting the fuel sulfur content to a maximum of 0.05%, by weight, assures good quality fuel and minimizes any concerns for these pollutants.

PRODUCTS OF INCOMPLETE COMBUSTION

Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

The emissions of CO exceed the PSD significant emission rate of 100 TPY with the Westinghouse 501F CT. The applicant has indicated that the CO emissions from the proposed combined cycle CTs with dry low-NO_x combustors are 20 ppmvd for natural gas firing (50 ppmvd during power augmentation) and 25 ppmvd for fuel oil firing with water injection. VOC emissions have been based on exhaust concentrations of 5 & 10 ppmvd for natural gas and fuel oil firing, respectively.

The majority of BACT emissions limitations have been based on combustion controls for CO and VOC minimization. Additional control is achievable through the use of catalytic oxidation. Catalytic oxidation is a post-combustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with wet injection. These installations have been required to use LAER technology and typically have CO limits in the 10 ppmvd range.

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst, such as platinum. Oxidation of CO starts at about 300°F, with efficiencies above 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at

temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required. For CT/HRSG combinations, the oxidation catalyst can be located directly after the CT or in the HRSG. Catalyst size depends upon the exhaust flow, temperature, and desired efficiency.

The application of oxidation catalyst is not technically feasible for gas turbines fired with fuel oil due to the oxidation of sulfur compounds and excessive formation of H_2SO_4 mist emissions. Catalytic oxidation has not been demonstrated on a continuous basis when using fuel oil.

Use of oxidation catalyst technology would be feasible for a natural gas-fired unit; however, the cost effectiveness of $4,000 per ton of CO removed for the Westinghouse 501F CT unit will have an economic impact on this project.

ACID GASES

Nitrogen Oxides (NO_X)

The emissions of NO_X represent a significant portion of the total emissions generated by this project and need to be controlled, if deemed appropriate. As such, the applicant presented an extensive analysis of the different available technologies for NO_X control.

The applicant has stated that BACT for NO_X will be met by using dry low-NO_X combustors to limit emissions to 15 ppmvd (corrected to 15% O_2 at ISO conditions) when burning natural gas (25 ppmvd corrected to 15% O_2 at ISO conditions during power augmentation) and 42 ppmvd (corrected to 15% O_2 at ISO conditions) with water injection and when burning fuel oil.

A review of the EPA's BACT/LAER Clearinghouse indicates that the lowest NO_X emission limit established to date for a combustion turbine is 4.5 ppmvd at 15% oxygen. This level of control was accomplished through the use of water injection and a selective catalytic reduction (SCR) system.

SCR is a post-combustion method for control of NO_X emissions. The SCR process combines vaporized ammonia with NO_X in the presence of a catalyst to form nitrogen and water. The vaporized ammonia is injected into the exhaust gases prior to passage through the catalyst bed. The SCR process can achieve up to 90% reduction of NO_X with a new catalyst. As the catalyst ages, the NO_X reduction efficiency, while holding ammonia slip emissions constant, will decrease.

The effect of exhaust gas temperature on NO_x reduction depends on the specific catalyst formulation and reactor design. Generally, SCR units can be designed to achieve effective NO_x control over a 100-300°F operating window within the bounds of 450-800°F. The preferable operating window is within the bounds of 600-750°F for effective NO_x control.

Most commercial SCR systems operate over a temperature range of about 600-750°F. At levels above and below this window, the specific catalyst formulation will not be effective and NO_x reduction will decrease. Operating at high temperatures can permanently damage the catalyst through sintering of surfaces. Increased water vapor content in the exhaust gas (as would result from water or steam injection in the gas turbine combustor) can shift the operating temperature window of the SCR reactor to slightly higher levels.

As stated by the applicant, the exhaust temperatures of the proposed combined cycle CTs for this site are between 950°F to 1100°F. However, catalyst can be located in the appropriate temperature range in the HRSG, but the applicant has stated that effective SCR operation will be difficult to maintain under significant load and ambient temperature variations. In this case, application of an SCR system appears to be technically feasible.

Although technically feasible, the applicant has rejected using SCR on the combined cycle units because of economic, energy, and environmental impacts. The applicant has identified the following limitations:

a) Reduced power output.

b) Emissions of unreacted ammonia (slip).

c) Increased H_2SO_4 mist emissions.

d) Disposal of hazardous waste generated (spent catalyst).

e) Ammonium bisulfate and ammonium sulfate particulate matter emissions (ammonium salts) due to the reaction of NH_3 with SO_3 present in the exhaust gases.

f) Cost effectiveness for the application of SCR technology to the project was considered to be $6,802 per ton of NO_x removed when compared to the use of dry low-NO_x combustors.

Since SCR has been determined to be BACT for several combined cycle facilities, the EPA has clearly stated that there must be unique circumstances to consider the rejection of such control on the basis of economics.

In a recent letter from EPA Region IV to the Department regarding the permitting of a combined cycle facility (Tropicana Products, Inc.), the following statement was made:

> "In order to reject a control option on the basis of economic considerations, the applicant must show why the costs associated with the control are significantly higher for this specific project than for other similar projects that have installed this control system or in general for controlling the pollutant."

For fuel oil firing, the cost associated with controlling NO_x emissions must take into account the potential operating problems that can occur with using SCR in the oil firing mode.

A concern associated with the use of SCR on combined cycle projects is the formation of ammonium bisulfate. For the SCR process, ammonium bisulfate can be formed due to the reaction of sulfur in the fuel and the ammonia injected. The ammonium bisulfate formed has a tendency to plug the tubes of the HRSG, thus leading to operational problems. As this is the case, SCR has been judged to be technically infeasible for oil firing in some previous BACT determinations.

The latest information available now indicates that SCR can be used for oil firing provided that adjustments are made in the ammonia to NO_x injection ratio. For natural gas firing operation, NO_x emissions can be controlled with up to a 90 percent efficiency using a 1 to 1 or greater ammonia injection ratio. By lowering the injection ratio for oil firing, testing has indicated that NO_x can be controlled with efficiencies ranging from 60 to approximately 75 percent. When the injection ratio is lowered, there is not a problem with ammonium bisulfate formation since essentially all of the ammonia is able to react with the NO_x present in the combustion gases. Furthermore, by using low sulfur fuel oil with low metal content and limiting excess air, the amount of sulfur trioxide available to form ammonium bisulfate is minimized. Based on this strategy SCR has been both proposed and established as BACT for oil fired combined cycle facilities with NO_x emission limits ranging from 11.7 to 25 ppmvd depending on the efficiency of control established.

The applicant has indicated that the total levelized annual operating cost to install SCR for this project at 100 percent capacity factor and burning natural gas is $4,544,600. Taking into consideration the total annual cost, a cost/benefit analysis of using SCR can now be developed.

For the Westinghouse 501F combined cycle CT and based on the information supplied by the applicant, it is estimated that the maximum annual NO_x emissions using dry low-NO_x combustors will be 1,212 tons/year (assuming 7,260 and 1,500 hours of operation per year while firing natural gas and fuel oil, respectively). Assuming that SCR would reduce the NO_x emissions from 15 ppmvd to 9 ppmvd when firing natural gas, and from 42 ppmvd to 15 ppmvd when firing fuel oil, 610 tons of NO_x would be emitted annually. When this reduction of 602 TPY is compared with the application of dry low-NOx combustors and considering the total levelized annual operating cost differential to be $4,544,600, the cost per ton of controlling NO_x is $7,549. These calculated costs are higher than has previously been approved as BACT.

A review of the latest Department BACT determinations show limits of 15 ppmvd (natural gas) using low-NO_x combustor technology for combined cycle CTs. Combustion turbine manufacturers are currently developing programs using both steam/water injection and dry low-NO_x combustor technology to achieve a NO_x emission control level of 9 ppmvd when firing natural gas.

Sulfur Dioxide (SO_2)

The applicant has stated that SO_2 emissions will be controlled by using fuel oil with a maximum sulfur content of 0.05%, by weight. This will result in an annual emissions rate of 140 TPY of SO_2 (each CT operating at 1,500 hours per year on fuel oil) plus 37 TPY of SO_2 when firing natural gas.

In accordance with the "top down" BACT review approach, only two alternatives exist that would result in lower SO_2 emissions. These include the use of a lower sulfur content fuel oil or the use of wet lime injection or limestone-based scrubbers, otherwise known as flue gas desulfurization (FGD).

In developing the NSPS for stationary gas turbines, EPA recognized that FGD technology was inappropriate to apply to these combustion units. EPA acknowledged in the preamble of the proposed NSPS that "Due to the high volumes of exhaust gases, the cost of flue gas desulfurization (FGD) to control SO_2 emissions from stationary gas turbines is considered unreasonable." EPA reinforced this point when, later on in the preamble, they stated that "FGD... would cost about two to three times as much as the gas turbine." The economic impact of applying FGD today would be no different.

Furthermore, the application of FGD would have negative environmental and energy impacts. Sludge would be generated that would have to be disposed of properly, and there would be increased

utility (electricity and water) costs associated with the operation of a FGD system. Finally, there is no information in the literature to indicate that FGD has ever been applied to stationary gas turbines burning distillate oil.

The elimination of flue gas control as a BACT option then leaves the use of low sulfur fuel oil as the next option to be investigated. The use of No. 2 fuel oil with a maximum sulfur content limit of 0.05%, by weight, as proposed by the applicant, is acceptable as BACT for this project.

BACT Determination by the Department

Combined Cycle CTs

NO_x Control

The information that the applicant presented indicates that the cost per ton of controlling NO_x for these turbines is $6,802, which is significantly higher when compared with other BACT determinations that require SCR. Operational experience of utilities elsewhere indicates that catalysts are lasting longer than expected. Therefore the Department believes the costs are somewhat lower. Based on the information presented by the applicant, the Department accepts the applicants conclusion that the use of SCR for NO_x control is not justifiable as BACT at this time.

A review of the permitting activities for combined cycle proposals across the nation indicates that SCR has been required and most recently proposed for installations with a variety of operating conditions (i.e., natural gas, fuel oil, coal and various capacity factors). The cost and other concerns expressed by the applicant are accepted and the Department determines that water injection and dry low-NO_x burner design as BACT for NO_x for this project for fuel oil and natural gas, respectively.

The applicant has proposed a NO_x emission limit of 106 lbs/hr/CT (15 ppmvd for natural gas) without power augmentation. CT manufacturers are currently offering NO_x guarantees of approximately 9 ppmvd. However, these CT manufacturers have no commercial operating experience to validate this guarantee basis. Considering the uncertainty regarding the basis of CT manufacturer's guarantees and the lack of commercial operating experience at this lower emission level, the Department has determined that a NO_x emission limit of 15 ppmvd @ 15% O_2 (106 lbs/hr/CT) for continuous compliance [1-hour average, not corrected to ISO conditions], is required. Several prior CT projects have already been permitted at 15 ppmvd @ 15% O_2 (natural gas) and 42 ppmvd @ 15% O_2 (No. 2 fuel oil). In those prior BACT

determinations, no allowances have been made for fuel bound nitrogen or for power augmentation operation. Measured NO_x concentrations shall not be corrected to ISO conditions to determine compliance with these BACT standards. Based on the first 12 months of actual operating data using natural gas, the Department may seek to revise and lower the NO_x emissions standard from 15 ppmvd @ 15% O_2 to no lower than 9 ppmvd @ 15% O_2; again, the NO_x emissions standard will not be ISO corrected.

SO_2 Control

BACT for SO_2 is the burning of No. 2 fuel oil with a maximum sulfur content limit of 0.05%, by weight. The Department accepts the applicant's proposal as BACT for this project.

VOC and CO Control

The Department is in agreement with the applicant's proposal of good combustion and operating practices as BACT for CO and VOCs for this project.

Other Emissions Control

The emission limitations for PM/PM_{10}, Visible Emissions, Be, and As are based on previous BACT determinations for similar facilities. Although the emissions of these pollutants could be controlled by particulate matter control devices, such as a baghouse or scrubber, the amount of emission reductions would not warrant the added expense. The Department accepts the applicant's proposed strategy of requiring good quality fuel for controlling these pollutants as BACT for the two combined cycle CT units.

The BACT emission limits for the Hardee Unit 3 project of two CTs for generating 300 MW and a single 140 MW steam turbine are as follows:

440 MW TOTAL COMBINED CYCLE COMBUSTION TURBINES

Pollutant	Emission Standards/Limitations Oil(a)	Gas(b)	Method of Control
NO_x	42 ppmvd @ 15% O_2	15 ppmvd(c) @ 15% O_2	Water Injection on oil; Dry Low-NO_x Combustor on gas
CO	25 ppmvd	20 ppmvd	Combustion controls; Limited Fuel Oil Operation
PM & PM_{10}	67 lbs/hr	7 lbs/hr	Combustion controls; Limited Fuel Oil Operation
Visible Emissions	≤ 10% Opacity ≤ 10% Opacity		Natural Gas No. 2 Fuel Oil
SO_2	0.05% S	1 gr S/100 scf	No. 2 Fuel Oil (max. 0.05% sulfur content limit, by weight)
VOC	10 ppmvd	5 ppmvd	Combustion controls
Be	--	--	Fuel Quality
As	--	--	Fuel Quality
Benzene	--	--	Fuel Quality

(a) No. 2 fuel oil with a maximum limit of 0.05% sulfur content, by weight. Fuel oil firing shall not exceed an equivalent of 1,500 hours per year per CT at full load (not to exceed 3,000 hrs/yr between the two CTs).

(b) Natural gas firing of up to 8,760 hours per year.

(c) Interim limit. May be retained or lowered (as low as 9 ppmvd at 15% O_2) based on the results of a study of the first 12 months of commercial operation.

Details of the Analysis May be Obtained by Contacting:

Mr. A. A. Linero, P.E., Administrator
New Source Review Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

9/27 1995
Date

Approved by:

Howard L. Rhodes, Director
Division of Air Resources Management

9/27 1995
Date

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PS Form 3800, March 1993

PSD-FL-214

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